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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/567,104	11/10/2006	Russell Chipman	256685US20PCT	3033
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OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314			EXAMINER ALLI, IYABO	
			ART UNIT 2877	PAPER NUMBER
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No. 10/567,104	Applicant(s) CHIPMAN, RUSSELL	
	Examiner IYABO S. ALLI	Art Unit 2877	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 November 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10 November 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>02/03/2006</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Specification

1. The disclosure is objected to because of the following informalities:

In paragraph [0012], line 1, "Figure xxx" should be changed to the appropriate 'Figure and number'.

Appropriate correction is required.

Claim Objections

2. Claims 13-16 are objected to because of the following informalities:

Claims 13-16 are misnumbered and should read 14-17.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claim 15 recites the limitation "a fourth set" in line 9. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims **1-15** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Zhou et al.** (7,287,855) in view of **Johs et al.** (5,936,734). (**'Zhou'** and **'Johs'**)

As to claim 1, Zhou discloses positioning and focusing an polarimeter **58** (Column 9, lines 60-65 and Fig. 4); illuminating the object **20** with a series of at least 16 polarization states (Column 11, lines 27-35 and Fig. 4); analyzing a plurality of reflected images corresponding to said at least 16 polarization states (Column 4, lines 17-20); obtaining a Mueller matrix is obtained for each image.

Zhou fails to disclose calculating a depolarization parameter.

However, **Johs** teaches calculating a depolarization parameter (Column 23, lines 53-56).

It would have been obvious to one skilled in the art at the time of the invention to include the method of calculation of **Johs** in the identifying method of **Zhou** in order to determine various imperfections within the object under test so that classifying and identification procedures can be carried out.

As to claim 2, Zhou in view of **Johs** discloses all of the claimed limitations as applied to Claim 1 above **in addition Zhou** discloses an average degree of polarization and a weighted average degree of polarization (Column 2, lines 49-51).

As to claim 3, Zhou in view of **Johs** discloses all of the claimed limitations as applied to Claim 1 above **in addition Zhou** discloses a degree of polarization surface and a degree of polarization map (Column 2, lines 49-51).

As to claim 4, Zhou in view of **Johs** discloses all of the claimed limitations as applied to Claim 3 above **in addition Zhou** discloses calculating at least one of a minimum and a maximum degrees of polarization (Column 11, lines 62-67).

As to claim 5, Zhou in view of **Johs** discloses all of the claimed limitations as applied to Claim 4 above **in addition Zhou** discloses wherein said step of calculating at least one of a minimum and a maximum degrees of polarization comprises calculating both a minimum and a maximum degrees of polarization (Column 11, lines 62-67); and calculating a difference between said minimum and a maximum degrees of polarization (Column 12, lines 1-5).

As to claim 6, Zhou in view of **Johs** discloses all of the claimed limitations as applied to Claim 1 above **in addition Zhou** discloses decomposing said Mueller matrix into a depolarization matrix and at least one of a diattenuation matrix and a retardance matrix (Column 2, lines 43-51).

As to claim 7, Zhou in view of **Johs** discloses all of the claimed limitations as applied to Claim 6 above **in addition Zhou** discloses calculating a depolarization relative to a corresponding diattenuation or retardance axis (Column 2, lines 43-51).

As to claim 8, Zhou in view of **Johs** discloses all of the claimed limitations as applied to Claim 6 above **in addition Zhou** discloses a depolarization relative to a corresponding diattenuation or retardance off-axis (Column 2, lines 43-51).

As to claim 9, Zhou in view of **Johs** discloses all of the claimed limitations as applied to Claim 8 above **in addition Zhou** discloses wherein said off-axis is 45.degree (Column 10, lines 28-34 and Fig. 6).

As to **claim 10, Zhou** in view of **Johs** discloses all of the claimed limitations as applied to Claim 1 above **in addition Zhou** discloses calculating a ratio of diattenuation to polarizance (Column 2, lines 43-51).

As to **claim 11, Zhou** in view of **Johs** discloses all of the claimed limitations as applied to Claim 1 above **in addition Zhou** discloses calculating a ratio of an average magnitude of Mueller matrix rows to an average magnitude of Mueller matrix columns (Column 16, lines 31-36 and Fig. 9).

As to **claim 12, Zhou** in view of **Johs** discloses all of the claimed limitations as applied to Claim 1 above **in addition Zhou** discloses an optical polarimeter **58**; an X-ray polarimeter; an IR polarimeter; and a UV polarimeter (Column 16, lines 13-17 and Fig. 9).

As to **claim 13, Zhou** discloses emitting laser light **62** to a retina via a polarizer, a first liquid crystal polarization controller, a non-polarizing beam splitter **66**, a rotating half-wave retarder **78**, and an objective lens (Column 9, lines 47-58 and Fig. 4); and reflecting light **92** from the retina to a co-polarized photodetector **104/106** via the objective lens **96** (Column 10, lines 1-11 and Fig. 4), the rotating half-wave retarder **78**, the non-polarizing beam splitter **66**, a second liquid crystal polarization controller **80**, and a polarizing beam splitter **98** (Column 9, lines 53-58).

Although **Zhou** is silent regarding the half-wave component being a ‘retarder,’ it would have been an inherent property of the half-wave component to be constructed with a plate that will allow controlled transmittance of the beam within the system.

As to claim 13 (interpreted as claim 14 by examiner), Zhou discloses all of the claimed limitations as applied to Claim 1 above **in addition Zhou** discloses passing light 92 from said polarizing beam splitter 98 to a cross-polarized photodetector 104/106 (Column 10, lines 1-5 and Fig. 4).

As to claim 14 (interpreted as claim 15 by examiner), Zhou discloses all of the claimed limitations as applied to Claim 1 above **in addition Zhou** discloses adjusting a light parameter by controlling the retardance of said first and second liquid crystal polarization controllers 78 and 80 by changing a respective retardance over more than one wave of retardation (Column 13, lines 36-43).

As to claim 15 (interpreted as claim 16 by examiner), Zhou discloses all of the claimed limitations as applied to Claim 1 above **in addition Zhou** discloses acquiring four sets of images (Column 15, lines 61-66), wherein a first set of images corresponds to the two liquid crystal polarization controllers being adjusted to $+7/8$ and $+7/8$ waves retardance, a second set of images corresponds to the two liquid crystal polarization controllers being adjusted to $+7/8$ and $+9/8$ waves retardance, a third set of images corresponds to the two liquid crystal polarization controllers being adjusted to $+9/8$ and $+9/8$ waves, and a fourth set corresponds to the two liquid crystal polarization controllers being adjusted to $+9/8$ and $+7/8$ waves.

Although **Zhou** does not teach the adjustment positions of the liquid crystal polarization controllers, it would have been obvious to one skilled in the art at the time of the invention to vary the retardance to obtain different wave values for calibration of the system.

7. Claim **16** is rejected under 35 U.S.C. 103(a) as being unpatentable over **Zhou et al.** (7,287,855) in view of **Easley et al.** (5,603,710). (**'Zhou'** and **'Easley'**)

As to claim **16** (interpreted as claim **17** by examiner), **Zhou** discloses producing a depolarization parameter and one of a retardance and a diattenuation parameter (Column 2, lines 43-51); collecting light reflected off the retina with a receiver **104/106** located outside of the eye **20** or inside of the eye **20** (Column 10, lines 1-5 and Fig. 4); analyzing the reflected light with a polarization state analyzer (Column 4, lines 17-20); obtaining a Mueller matrix image; and analyzing said Mueller matrix (Column 16, lines 31-36 and Fig. 9).

Zhou fails to disclose illuminating a retina with polarized light via a probe inserted into the eye.

However, **Easley** teaches illuminating a retina with polarized light via a probe **25** inserted into the eye (Column 2, lines 46-51 and Fig. 3).

It would have been obvious to one skilled in the art at the time of the invention to include the probe of **Easley** in the retinal polarimetry method of **Zhou** in order to safely illuminate specific areas of the object under test with minimal disturbance to other areas.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to IYABO S. ALLI whose telephone number is (571)270-1331. The examiner can normally be reached on M-Thurs. 7:30a- 5pm, 1st F-OFF & 2nd F- 7:30a-4pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory Toatley can be reached on 571-272-2059. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

IYABO S. ALLI
Examiner
Art Unit 2877
April 24, 2008 /I. S. A./

/L. G. Lauchman/
Primary Examiner, Art Unit 2877